

Literary Analytical Discussion of Digital Storytelling and Its Relation to Automated Narration

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Abstract

Digital Storytelling, a new form of interactive narration, is discussed in regard to literary theory and computer science. The discussion leads into our approach of automated narration as a data structuring method for information systems. The usage of the approach in recent projects is quoted to describe the functional practice of interactive narrative systems in Human-Computer Interaction.

1 Introduction

During years of advances in computer science, the computer changed from an object of utility and assistance to a multi-media, network-connected information medium. This evolution of the computer to a content-based medium is still in progress - but certainly we lack a structuring method that involves the user in the same kind of way traditional content-based media, like television, radio or books, do.

Traditional content-based media use dramatic structures (stories) to enhance suspense and immersion. Immersion takes place via a number of factors. Ryan [Rya01] distinguishes between spatial, temporal and emotional immersion. Dramatic structures intensify the temporal and emotional immersion: The temporal immersion is given via the expectations of the audience in regard to the experiences of the protagonist of a story. The emotional immersion is given via the structure of the Drama itself: Typically the first act is giving an explanation for the ongoing actions and motivations of the drama's characters. The audience knows both, the goals of the protagonists as well as what the protagonists will suffer should they not reach those goals.

The computer, in contrast to traditional content-based media, is action-related, user-centered and interactive - things that are not defined as immersive in the traditional sense.

The content - and, therefore, the story - of the common application, even if it is a computer game, is a function of possible user actions to system reactions. This lacks dramatic structure, therefore, it is hardly suspense-packed: The audience demand for a replay is decreasing if (after a time) the computer graphics are antiquated or the goal of the game is achieved. In contrast, the audience of a Hollywood feature film enjoys the same film again and again.

Narrative Intelligence, see Mateas and Sengers [MS99], tries to use content-dependent narrative structures for interactive multimedia to enhance immersion and suspense. However, whether this goal can be reached remains controversial, see Neuhaus [Neu01]: If a user participates in interactive narration via her actions, when does the reception of a story ends, when does the interaction begin - where is the line between generating and consuming a story? To solve this problem, the classical narrative structures have to be analyzed and broken down for the creative and destructive usage of traditional forms, see Suter [Sut00].

There are at least two categories of narrative intelligence: generic story systems (that build a whole new story) and story telling systems (that interactively narrate a predefined story). *Digital Storytelling*, as used at ZGDV e.V., is from the second category - the story telling systems. In the following paragraphs, we will explain the literary theoretical background of Digital Storytelling, discuss our approach to interactive narration and quote project work and experiences with Digital Storytelling.

2 Literary Analysis of Digital Storytelling

Digital Storytelling is a successor of the literary genre of *computer literature*, see Lorenz [Lor92], and, therefore, from the automated generation of stories. But as mentioned before, Digital Storytelling is the interactive telling of

pre-authored stories - therefore, it seems reasonable to define Digital Storytelling as it pertains to several literary categories and genres (subcategories).

2.1 Literary Category

For the German language area, Goethe defines three categories (Gattungen): Lyric, Epic and Dramatic. Trying to categorize Digital Storytelling into these three categories is problematic: Interactive Stories have a storyteller - this indicates an Epic. But the mimetic presentations and the pre-construction of the stories tend to be a genre of Dramatic. Therefore, the stories defined by Digital Storytelling are Epics with dramatic attributes, supplemented by interaction. Digital Storytelling attempts to do the splits between Epic and Dramatic, just like the Novella genre of Epic and the Epic Theatre (Brecht) of Dramatic.

The Novella is of the category Epic, but with an internal dramatic structure: It shows events that are interpreted as turning points within the life of a protagonist; this causes actions that rise to a climax. Therefore, the Novella offers the dramatic structure of exposition, a climax or turning point, a decline and an end, see Braak [Bra69, pp.550]. The following would seem an adequate description of Digital Storytelling:

Digital Storytelling is the interactive mimetic presentation of Novella.

The Epic Theatre of Brecht does the same split, but comes from the opposite direction. Brecht ranks scenes without dramatical construction, narrating them side-by-side. This causes the Drama to have an Epic form. Brecht tries to free the audience of its passive perception to trigger an in-depth (critical) reflection of the things seen on the stage. It seems that 60 years after Brecht, the straddle between Epic and Dramatic once again attempts to overcome the passive role of the audience.

2.2 Narrative Elements

Now we know about the literary category and genre, but what do we know about the narration of the story? To discuss the narrative elements used with Digital Storytelling, it is useful to know the general definition of narration, see Weber [Web98]:

- Narration is a serial addressing of temporal specified circumstances.
- Narration does apply to the non actual.

- Narrators are outside the narration.
- Narration has two points of orientation - the first is the me-here-now system of the narrator; the second is the me-here-now system of the characters of the narration.
- Narration is addressing the audience.
- Narration is successive (showing the progression of actions) and non-perfective (there is no denotation of accomplished facts).

These criteria are valid for Digital Storytelling, but the first and second criteria are limited:

Digital Storytelling is of course using the serial addressing of temporal specified circumstances, as the audience is receiving a linear experience and therefore a linear story, but the narration is interactive and generally non linear. Therefore, the single temporal points, as well as the sequence of story elements, are not predefined.

Digital Storytelling implies an actual experience of the audience and, therefore, does not apply to the non actual, but to the actual. This is another hint of the dramatic structure of an interactive, non linear story, as the Drama is based on the actual too. As Wilder says: "On the stage it is always now", see [Web98, pp.24].

2.3 Dramatical Classification

For the discussion of the dramatic elements of Digital Storytelling, we refer to Staiger's definition of the form category of *Dramatic* (Formkategorie des Dramatischen), see [Bra69, p.117]. He used the term Drama to describe *the playing of characters*, therefore, as a mimetic presentation. Braak said that the key to the Dramatic is dialogue, if the dialogue raises suspense, see [Web98, pp.117]. The actions within a Drama are aspiring to a peak level, therefore, a Drama is directional. Suspense emerges when the audience awaits the peak level. Digital Storytelling adopts this characteristic: actions are presented if and only if the presentation of the actions is relevant and important for the storyline.

Within the form category of Dramatic there is a distinction between One-Place-Drama (Einortdrama) and Motion-Drama (Bewegungs-drama). At first glance, it seems that Digital Storytelling is a kind of Motion-Drama, as the audience has freedom of movement and is able to change the stage from one to another. But the audience can only be in

one place at a time; this implies that the audience does not know about parallel actions happening on different stages. Therefore, the audience is itself a dramatic person, with the limited, subjective knowledge of a dramatic person. Digital Storytelling has to use One-Place-Drama techniques.

Furthermore, Digital Storytelling is a Closed Drama (Geschlossenes Drama). The Closed Drama gives an extraction of reality in a closed ensemble. Actions, space and time are consistent; a grand augmented play (see [Dra]) is determinedly moving in a specified direction. This characteristic is opposite to the Open Drama (Offenes Drama) that offers a multitude of (dramatically equivalent) actions, spaces and timelines, see Klotz [Bra69, p.225]. Even if a scenic assembly of stories seems to be similar with an Open Drama, these scenes are dependent on the course of the story as a whole, like in a Closed Drama.

In conclusion, the characteristic of Digital Storytelling in the form category of Dramatic can be classified as Closed One-Place-Drama.

3 Automated Narration

Previous reflections indicate that the story structure should offer a well-defined description method of a Closed One-Place-Drama, with the literary characteristics of a Novella. The structure should enhance the interactive narration of the story.

It seems that the semiotic approach to story morphology by Propp [Pro58] offers the properties needed by Digital Storytelling:

Propp defines a story as a set of morphological functions, dependent of the dramatic characters within those functions. He writes that [Pro58, p.21] “Function is understood as an act of a character, defined from the point of view of its significance for the course of the action:

1. Functions of characters serve as stable, constant elements in a tale, independent of how and by whom they are fulfilled. They constitute the fundamental components of a tale.
2. The number of functions known to the fairy tale is limited.”

Propp showed how one can generate new storylines by algorithmically processing the semiotic structure.

We found that it is possible to get a machine-usable structure of interactive stories by the morphological processing of several

narrative sequences and dramaturgical classification (so-called *dramatis personae*) of the story’s characters. This way, it is possible to narrate variants of a story, based on the author’s constraints and user interaction. The resulting story engine performs the story on two abstract levels:

- A realtime user-adapted storyline is generated by processing the collection of playable function sequences. Collection is done in regard to the morphology, actual user interaction¹, the overall playable scenes, the scenes already played out, possible nested storylines (so-called moves) and author-given constraints (e.g. limited playtime).
- The story is narrated by mapping the functions on real scenes.

This kind of automated narration fits in with the definition of Digital Storytelling and is used in several projects as listed in the following paragraph.

4 Projects and Results

Very ambitious is the term for the German Federal Ministry of Education and Research (BMBF) funded project *Geist*. *Geist* (engl. *ghost*, a metaphor for the spirit of history) explicitly shows the correlation of humanlike communication/interaction, story structures and the user’s enjoyment of the application. Within the *Geist* System, the history of an arbitrary city - prototyped with the city of Heidelberg and the Thirty Years’ War - is shown in a way that the audience receives an immersive, dramatic and suspenseful experience. The historical data are served via the automated, interactive story narration, including an environment (buildings, parks, gates, fountains, etc.), the historical image of the environment (buildings in their historical form, potentially artifacts from a past age that do not exist in the current time), different dramatic characters (based on historical figures) and the user (involved as a dramatic entity of the story).

The user is utilizing interfaces that offer an acoustic and graphic, as well as haptic (by means of so-called magic equipment) access to the story - via augmented reality seamlessly integrated into the user’s own reality. This means users can see with their own eyes, touch

¹The user interactions are defined via so-called story acts - symbolic notifications about the fulfillment of morphological functions.



Figure 1: User (top) AR view of Katharina (bottom), a ghost 'living' in the castle of Heidelberg.

with their own hands, talk with their own mouths - to interact with the historical characters and manipulate the storyline. The user is experiencing first-hand the circumstances of life in the time of the Thirty Years' War and is interactively involved in the fate of the virtual characters, see figure 1.

Another project is the so-called IzA information system: IzA (*Information zum Anfassen*, engl. *tangible information*) is a mixed reality kiosk system. The system is engaging the user (typically visitors of ZGDV) in an information space via two conversational avatars (one virtual, see figure 2, one physically represented), driven by a morphological adaption of a sales pitch as the narrative structure. Via mixed reality interaction (placement of flyers, gesture recognition, etc.) the user influences the narration, but (like with Geist) is lead to a defined end of his visit within a defined period of time.

The automated narration approach is used in both environments (augmented reality environments using mobile networks, fuzzy location tracking; mixed reality environments using physical units, gesture recognition). The suspense of the story is generated by the morphological story model. Within Geist and IzA, several actors and the user are coordinated by the story engine, using the morphological story structure.

First lessons learned include the difficulty of authoring an interactive story. It seems to be of great importance to provide the author with an insight into the automated narrative

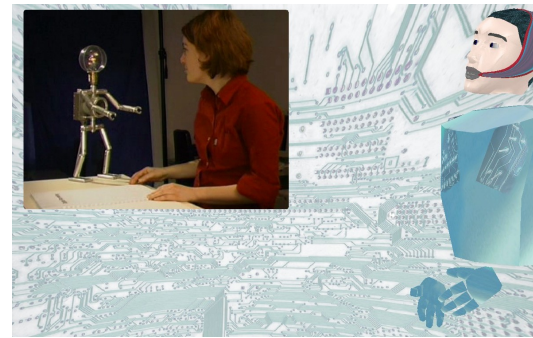


Figure 2: Virtual avatar, interacting with the user and physical avatars.

structures to enhance the scripting of a story.

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